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42. mass of $CaCl_2$ = 1(Ca) + 2(Cl)
= 1(40.08) + 2(35.45) = 110.98g

$\%\ Ca = \frac{40.08}{110.98} \times 100 = 36.11\%$ $\%\ Cl = 100\% - 36.11\% = 63.89\%$

43. mass of Na_2SO_4 = 2(Na) + 1(S) + 4(O)
= 2(22.99) + 1(32.07) + 4(16.00) = 142.05 g

$\%\ Na = \frac{2(22.99)}{142.05} \times 100 = 32.37\%$ $\%\ S = \frac{32.07}{142.05} \times 100 = 22.58\%$

$\%\ O = 100\% - (32.37\% + 22.58\%) = 45.05\%$

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48. $81.82\text{g C}\left(\frac{1\text{mol}}{12.01\text{g}}\right) = \frac{6.8127\text{mol C}}{2.2225\text{mol}} = 3.06$

$35.56\text{g O}\left(\frac{1\text{mol}}{16.0\text{g}}\right) = \frac{2.2225\text{mol O}}{2.2225\text{mol O}} = 1$

C_3O

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52. $49.98\text{g C}\left(\frac{1\text{mol}}{12.01}\right) = \frac{4.1615\text{mol}}{4.1615}$

$10.47\text{g H}\left(\frac{1\text{mol}}{1.01}\right) = \frac{10.0693}{4.1615} = \sim 2.5$

$C_2H_{2.5}$ multiply by 2

C_2H_5 = empirical formula
= 29.07g

$\frac{58.12\text{g}}{29.07\text{g}} = \sim 2$ molecular formula C_4H_{10}

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54. $19.55\text{g K}\left(\frac{1\text{mol}}{39.10\text{g}}\right) = \frac{0.5\text{ mole K}}{0.25} = 2$

$4.00\text{g O}\left(\frac{1\text{mol}}{16.0\text{g}}\right) = \frac{0.25\text{mol O}}{0.25} = 1$

K_2O